REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

I. Claim Amendments

Claims 1, 3-13, 15-19 and 21-23 were presented in the Amendment After Final Rejection filed November 5, 2010. Non-elected claims 9-12, 17-19 and 22 were withdrawn from consideration.

By this Amendment, claim 1 has been amended to recite a time-temperature indicator for indicating a temperature change over time, comprising (a) at least one indicator compound, and "(c) a color filter that substantially filters out only the wavelength ranges causing undesirable renewed coloration of the indicator after the time-temperature clock has started". Support for the color filter of claim 1 can be found in paragraphs [0018], [0108] and [0128] of the published U.S. Application (US 2007/0172951). Claim 1 has also been amended to delete "(b) a reference scale for evaluating the degree of decoloration or coloration", and this feature has been presented in new claim 24.

Claim 13 has been amended to recite the color filter of amended claim 1.

Claim 22 has also been amended to recite the color filter of amended claim 1, and to recite (b) a reference scale or "reference color". In addition, new claim 25 has been added to recite that the reference scale is a "reference color". Support for the amendments to claim 22 and new claim 25 can be found in paragraphs [0129] and [0130] of the published U.S. application.

New claim 26 has been added to recite that the at least one indicator compound is present in a "crystalline form". Support for this claim can be found in paragraphs [0016], [0031] and [0192]-[0208] (Examples 1-3) of the published U.S. application.

II. Telephonic Interview

Applicants appreciate the courtesies extended to Applicants' attorney by Examiner Alexander during the telephonic interviews held December 16, 2010, January 19, 2011 and February 28, 2011.

During the December 16, 2010 interview, Applicants' attorney asserted that the Zweig et al. reference teaches that the indicator becomes "darker" upon exposure to light, but the "protector" in claim 1 of the present application prevents renewed photo-induced coloration of the indicator. The Examiner took the position that preventing renewed photo-induced coloration

of the indicator is intended use language that does not distinguish the structure of the time-temperature indicator over the art. The Examiner suggested amending claim 1 to recite a color filter that is permeable only to certain wavelengths of light, rather than "a protector" that prevents renewed photo-induced coloration of the indicator.

During the January 19, 2011 interview, Applicants' attorney proposed to amend claim 1 to recite "(c) a color filter that substantially filters out the wavelength ranges causing undesirable renewed coloration of the indicator after the time-temperature clock has started". The Examiner stated that this proposed amendment does not distinguish the claimed time-temperature indicator over the references, because the claim does not include a specific wavelength range and could filter out all possible wavelengths.

During the February 28, 2011 interview, Applicants' attorney proposed amending claim 1 to recite "(c) a color filter that substantially filters out **only** the wavelength ranges causing undesirable renewed coloration of the indicator after the time-temperature clock has started". This claim language distinguishes the color filter of claim 1 from a protector or cover that is completely impermeable to all visible and UV light, such as aluminum foil. The Examiner indicated that the term "only" appears to distinguish the color filter from a cover, such as aluminum foil, which would completely filter out all wavelength ranges. However, the Examiner indicated that he would have to perform a new prior art search and discuss the claim language with a Primary Examiner before he could agree to allow the claim.

In addition, during the February 28, 2011 interview, Applicants' attorney proposed to delete the feature of "(b) a reference scale for evaluating the degree of decoloration or coloration" and recite it in a new dependent claim. The Examiner stated that the patentability of claim 1 depends upon the "color filter", and the reference scale (or reference color) feature(s) may be recited in dependent claim(s).

Applicants have carefully considered the Examiner's comments and suggestions in preparing the amendments submitted herewith.

III. Claim Rejection Under 35 U.S.C. § 103

The Examiner has rejected claims 1, 2, 5-8, 15, 16, 21 and 23 under 35 U.S.C. § 103(a) as being unpatentable over Ignacio et al. in view of Zweig et al. (US 2003/0139903). As applied to the amended claims, Applicants respectfully traverse the rejection.

Ignacio et al. disclose a spiropyrane. Zweig et al. disclose a time-temperature indicator comprising a non-identified colorimetric indicator that becomes **darker** upon exposure to light and a reference chart (see paragraph [0031]). In this connection, initially the inner ring of Zweig et al. should be a lighter color than the outer ring. If the inner ring has changed color and matches or is darker than the color of the outer ring, then the test elements have been exposed to excessive temperatures for a prolonged period of time (see paragraph [0031]).

On the other hand, in the claimed invention it has been found that the darkening step of spiropyrans and diarylethenes cannot be meaningfully used to indicate time and temperature on their own. In the claimed invention, the spiropyrans and diarylethenes are transferred into the colored state by irradiation with UV-light. Then, a color filter is applied that substantially **filters out only the wavelength ranges causing undesirable renewed coloration** of the indicator after the time-temperature clock has started. This allows the claimed time-temperature indicator (TTI) to proceed **solely as a function of time and temperature**.

As discussed in the present specification, the way the claimed TTI works is as follows: "Illumination of the TTI loaded with fine crystalline powder of (11) turned it deep blue. The illumination activates the system as a TTI **and in the absence of any additional light illumination the system is sensitive only to the temperature and time. In the dark, the acyclic photoproduct form of the active matrix reverts to the stable colorless form**, as shown in Fig. 4" (see paragraph [0198] of the published application) (emphasis added).

Moreover, as discussed in the present specification, preferably, a diarylethene or spiroaromatic indicator compound in crystalline form is transferred from a colorless state into a colored state by activation with UV-light. **Then, a filter is applied to avoid reactivation**, but the filter must allow for visual monitoring. The backward reaction, i.e. the decoloration, is used to monitor the time-temperature history. The degree of decoloration is visually monitored by comparison to a reference scale that gives a clear and visual Yes/No signal whether the perishable good can still be used (see paragraphs [0119]-[0130] of the published application).

As acknowledged by the Examiner during the February 28, 2011 interview, the references do not disclose or suggest a time-temperature indicator for indicating a temperature change over time, comprising (a) at least one indicator compound, and "(c) a color filter that substantially filters out **only the wavelength ranges causing undesirable renewed coloration of the indicator** after the time-temperature clock has started", as recited in claims 1 and 13.

Therefore, claims 1 and 13 would not have been obvious over the references.

Claims 5-8, 15, 16, 21 and 23, and new claims 24-26, depend directly or indirectly from claim 1, and thus also would not have been obvious over the references.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

IV. Claim Objection

The Examiner has objected to claims 3 and 4 as being dependent upon a rejected base claim, but indicates that they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants appreciate the indication of allowable subject matter, but respectfully submit that claim 1, from which claims 3 and 4 depend, is allowable for the reasons discussed above. Accordingly, reconsideration and withdrawal of the objection are respectfully requested.

V. Conclusion

For these reasons, Applicants take the position that the presently claimed invention is clearly patentable over the applied references.

Therefore, in view of the foregoing amendments and remarks, it is submitted that the objection and rejection set forth by the Examiner in the final Office Action have been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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